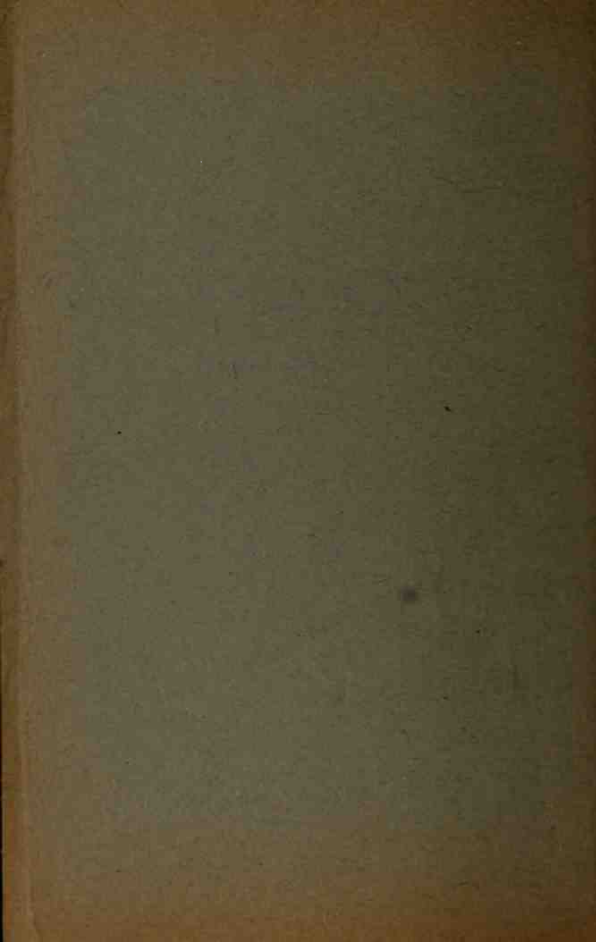


LITTLE BLUE BOOK NO. 599
Edited by E. Haldeman-Julius

Haeckel's Monistic Philosophy

Carroll Lane Fenton



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HAECKEL AT THE TIME WHEN HE WROTE
THE "RIDDLE OF THE UNIVERSE."

HAECKEL'S MONISTIC PHILOSOPHY

FOREWORD

In the preceding volumes of the Little Blue Books that are devoted to the life and achievements of Ernst Haeckel, the treatment is in the main historical. They give the story of his life as a youth, a naturalist, and a philosopher working and writing at a time when very great things were being done in natural science, telling what he did and the manner of his doing it. And perhaps, in the long run of human affairs, this is the side of Haeckel that will count for most, yet it is not by any means the whole. For the pioneer champion of Darwin, the describer of medusæ and siphonophores, and the creator of the science of morphology, was not alone a man of research and quiet thought; he was a surveyor of the general affairs of men, and the leader in a school of philosophy that to a greater or less degree is followed wherever science is pursued.

And so it is that this booklet is given over to a study of the monistic philosophy as it was conceived and developed by Ernst Haeckel. In the booklet immediately preceding we have traced the principal lines of mental development which made this philosophy possible, and have shown the part it played in Haeckel's daily life, both as a scientist and as a propagandist. In this we shall consider only monism itself, and with a few exceptions, only in the form which Haeckel developed it. Furthermore we shall view it principally from the

angles of science and common-sense, as Haeckel probably would wish it to be viewed. The reasons for this are several. In the first place I, like Haeckel, am untrained in technical philosophy, and therefore unqualified to write a critique of monism from the viewpoint of that science. Furthermore, plenty of such critiques have been written, and in nearly every one of them the author assures the public that he has so thoroughly disposed of Haeckel as a philosopher that there is no need for further criticism. There are some exceptions, of course, and now and then one finds an academic philosopher who is in warm sympathy with the great naturalist. But in the main, Haeckel has a rather low standing with the men of word-splitting schools, and gets little criticism from them that contributes to monism.

On the other hand, I have managed to acquire a certain training in natural science; enough, at least, to doubt gravely the assurances of non-scientific pedagogues, and to see where such authorities as Professor Oswald Külpe make far greater blunders in zoology than they lay to Haeckel in fields of logic, dialectic, and tradition. Moreover, I find that there are very few critiques of Haeckelian monism written by naturalists, and that most of those are of two to five decades in age. The scientist of today, I am inclined to think, does not give very much attention to systems of philosophy, probably, as Elliott hints, because he has found them largely metaphysic and therefore sterile. With this initiative, and the additional stimulus provided by our bands of protestant devil-hunters

who maintain such cordial relations with legislatures and boards of regents, the naturalist of today is very apt to maintain that the proper study of the scientist is science, and let philosophy and religion severely alone. For after all, one must work if he is to eat, and the college professor has not yet acquired the ability to subsist on hay and circulars.

Thus it is that when I write of monism purely as a naturalist I can be moderately sure, both of putting down things worth while to read, and of finding that they have not been written too many times by others before me. Now and again I shall offer criticisms, but they be those of a naturalist and not of a philosopher, or of one who aspires to that rank. Occasionally I shall disagree—but the differences will be derived from simple facts in the fields with which Haeckel was familiar, and therefore of no great importance. In fact, though I am more of a materialist than was Haeckel, I have such sympathy for his ideas that I could not write of them other than with favorable prejudice. And since this is so, I shall not try to conceal it; while if I chance to attack unjustly the ideas of technical philosophers, the reader may put the error down to insufficient knowledge in a field whose outer portions have not proved very inviting.

—C. L. F.

"The close of the nineteenth century offers one of the most remarkable of spectacles to the thoughtful observer. All educated people are agreed that it has in many respects immeasurably outstripped its predecessors, and has achieved tasks that were thought impracticable at its commencement. An entirely new character has been given to the whole of our modern civilization, not only by our astounding theoretical progress in sound knowledge of nature, but also by the remarkably fertile practical application of that knowledge of technical science, industry, commerce, and so forth."

—Ernst Haeckel.

"Compared with our astounding progress in physical science and its practical application, our system of government, of administrative justice, and of national education, and our entire social and moral organization, remain in a state of barbarism."

—Alfred Russel Wallace.

HAECKEL'S MONISTIC PHILOSOPHY

CHAPTER I

THE ORIGIN OF MONISM

Philosophy, as the search for truth in its highest sense, seeks to unite the isolated discoveries of mankind and produce from them one unified system of the known universe. In this purpose it is closely akin to religion, and of greater antiquity than science, which is essentially a *causal* organization of knowledge. For one may devise a scheme of the world without paying much attention to true causal relationships, just as he may formulate a system of life, death, and hereafter and at the same time remain profoundly ignorant of the nature of life or of death, or of the probabilities of a hereafter.

Philosophy, then, is of very ancient lineage, and of close kin to religion. In fact, the two doubtless began together. The primitive savage who heard the roar of thunder, witnessed lightning smite a tree, and saw the tree writhe in the grip of the terrible fire, turned at once to religion. Thunder was a mighty power and lightning his weapon; in the tree was a spirit akin to that of the savage himself, which fought against the spirit of the sky. Now and then tree spirits became angry at men, and dropped branches on them; when there was rain the thunder spirit roared, and the chances were that he caused the rain, as he caused the

lightning. The mere matter that lightning came first had little significance; do not wild beasts and warriors shout after they have struck? And so, by putting one and one together, and uniting them with many other twos, the savage evolved what was at once his religion and his philosophy. It told him what to do and how, and it also told him in what way the universe was organized. The question of cause probably did not enter for many centuries, and when it did, received similar treatment. It is not for the believer to reason why, for the ways of the gods are mystery.

In such a system as this there are two very important elements: that which lives, and that which does not live. They are connected, yet they are far from identical. The spirit of a man has a home in his body, yet it may ascend to the upper air, or fly over mountains to injure an enemy or talk with a departed. The manitou of a river lives forever, though a year from now there will not be a drop of water left of that which makes up the stream today. The non-living is the tool, the house, the clothing of the living, to be used and thrown away at convenience. That which is alive differs fundamentally from that which is dead, for the spirit is what really counts. And the affairs of the universe are guided, not by the substance of the universe, but by its life.

Such a system, whether it be philosophy or religion, is a dualism, a system made up of two elements. When the first dualism was formulated we do not know; when the last one shall die is a matter for speculation. We know

that by the beginning of history dualisms, highly developed and with customs and traditions indicative of high antiquity, dominated the world. In most of them the spiritual element was divided into many parts, so that there was a dualism within it. There was a good god and a bad, each ruling his part of the universe and striving to overthrow the other. In addition, there might be a whole throng of minor gods, sons and daughters of the gods, mistresses, slaves, saints, minor devils, and so on, varying in number, nature, and function with each system. In all of the highly developed ones, as well as in teleologies and philosophies, the idea of a principal god was highly developed, whether he be Zeus, Vishu, or Yahweh. This god was ruler of the universe, creator of all, infinite in duration and power in some religions, while more or less limited in others. Such a god was set against the world, which was of his creation, and the two were given roles of master and slave, creator and creature, divine spirit and earthy matter. Such an express and ancient dualism characterized, as we have said, all of the older religions and philosophies either at their inception or some later period, and were carried almost bodily into the church religions of the Christian era. And it is particularly through these, the great monotheisms of the Mediterranean, that the dualistic conception has influenced the modern world.

Yet let us glance again at this dualism. Is it so plain, so true, as its adherents suppose?

What is this spiritual element, and how does it operate?

These questions suggested themselves to philosophers and poets long before the nineteenth century. Plato, it is true, held a rigid dualism. Xenophanes compared the gods and man, and saw little doubt as to their nature. "It is," he wrote, "men who have created the gods, for in those latter they find again their own shape, their feelings, their speech. If oxen knew how to depict, they would give to their gods the form of oxen." Anaxagoras abandoned the ancient theory that the stars were gods, while the sophists made public jest of the gods. "It is not for me," said Protagoras, "to seek out either if the gods exist or if they do not; many things hinder me from this, notably the obscurity of the subject and the shortness of human life." The Roman Lucretius, author of "*De Rerum Natura*," went even farther. He denied all efficiency to the gods, though he was too much of an agnostic to maintain that they did not exist. Upon religion he heaped greater contumely than did Haeckel many centuries later, and ridiculed keenly such theological doctrines as the coming-in of souls. For Lucretius, nature and divinity were one, as were mind and the soul, while conscious life apart from the body was a contradiction in itself. He even went so far as to specify the sort of substance on which consciousness and the so-called mind depend; according to him it was made up of "seeds exceedingly round and exceedingly minute in order to be stirred and set in motion by a

small moving power." How closely this approximates the modern conception of cells is obvious.

So we see that many ancient philosophers found the dualistic conception unsatisfactory, and devised a scheme of the world in which there was complete unity, the supposedly distinct mental element being nothing more than the functioning of particles of living matter. But the theologians clung firmly to the rock of revelation, and upon it they proceeded to dogmatize with never a thought as to how they might discover the actual facts of the case. And for more than a thousand years they imposed this course upon a servile Europe.

Finally, however, they encountered opposition which could not be suppressed. Man's natural curiosity, his desire to find out how a thing works, asserted itself, and there was a rebirth of natural science that far transcended anything it had accomplished in antiquity. For the Greeks, though admirable philosophers, made very poor research men, and in the records of Asia and Africa there is little trace of pre-Christian natural history. The real awakening came in northern and western Europe during the sixteenth and seventeenth centuries, and by the middle of the eighteenth the natural sciences were well on their feet.

The immediate effect of such discoveries as those of Galileo and Newton was to forcibly revise man's conception of the universe. God and the angels were summarily ejected from the heavens, just as dragons had been dismissed from the sea by the exploring voyagers.

Minor dogmas, such as the flatness of the earth, were destroyed by these same voyagers; naturalists came to doubt the hypothesis of special creation and to speculate as to a natural origin of species. In short, the more men learned about the nature of the earth and its inhabitants the less certain they became about the distinction between spirit and matter, God and the world.

The gathering storms of doubt burst a few years after Darwin established the doctrine of evolution. At last the finger of God was taken out of the immediate operations of life, just as it had been removed from the development of the embryo. Even man, heretofore the special creation of deity and the center of the universe, was shown to be an animal descended from animals. The chemist and physicist discovered new things about matter; the anthropologist and psychologist began to study the mind and habits of the highest of animals as the ornithologist studied those of birds. Evolutionary zoology found itself in accord with astronomy in developing an orderly world in which nothing came by chance. Science truly was discovering great things.

And almost without exception, these new facts cast doubt upon the major dogmas of Christian dualism. Man was an animal, whose supposedly divine mind behaved as the body dictated, and that body was as much a museum of relics as a perfect organism. Matter did not come from nothing nor did it vanish to nothing; what appeared solid actually was a mass of whirling particles too small for even

the microscope to perceive. The old distinctions were gone; one could not tell where plants ended and animals began, and the chemist was beginning to hold that he could make many a substance which supposedly came only from living bodies. And finally, accurate historical research proved book after book of the Hebrew bible to be merely tradition, like the sacred legends of the East, and if this were true the whole hypothesis of revelation must go. Clearly the times called for a new movement in philosophy as well as in religion, and they demanded that it come from the realm of science.

CHAPTER II

EVOLUTIONARY MONISM

Since the great impetus of the new knowledge of the latter half of the eighteenth century came from evolution, it was but natural that an evolutionist should found the new movement which his science made necessary. And by all means this man must be a daring one, willing to risk much, and to reach boldly for great things that lay far in advance of his time. For the philosopher not only pictures the spirit of his time, but offers some prophecy of what is to come. And in a period where the dogmas of centuries are being thrown over in a few months the cautious man cannot be a prophet.

We already know that caution was not a

characteristic of Ernest Haeckel; had it been, he would not have openly declared for evolution when the course might mean poverty. Nor was he half-hearted, with feeble imagination, or he would not have maintained the natural origin of man while even Darwin hesitated. And the fact that Haeckel was of a philosophic turn showed even in his first treatise on taxonomic protozoology. Therefore it is by no means surprising that, seven years after the publication of the "Origin of Species" we find him outlining a system of evolutionary, materialistic monism. Let us review his argument, as published at various times between 1866 and 1905:

August Comte had pictured a purely human universe in which man, though king of nature and highest creation of divinity, had very little to do. Spencer, much more of a naturalist, and a strong Darwinian, believed that at the center and origin of all things is a great Unknowable, a principle neither to be avoided nor understood, but which bound together religion and science. Both systems were thoroughly dualistic, and metaphysical, and did nothing more than make a shallow verbal truce between religion and science. Such a state of affairs was intolerable to Haeckel, in whom desire for order and certainty were almost passions. He determined to bring the conflicting movements face to face, and settle once and for all the validity of the claims of each. Nor was he interested in religion and science as they ought to be or said they were, for he knew well that a movement could have one

reality and another name. What he determined to deal with was not "idle scholastic entities, but religion and science as they are when, desirous of genuine meaning and concrete reality, we look at the conclusions which they both declare, the principles on which they rest." Thus, and only thus, could a practical settlement be achieved.

In the first place, said Haeckel, he would disregard the Catholic and more orthodox protestant sects, for in them were ignorance and superstition patent even to the liberal religionist. Instead, to make the case the more conclusive, he would choose one of the more advanced protestant groups, whose preachers received a good or average education, and who therefore could make some allowance for the results of science and historical research.

Yet even in such groups there are dualistic dogmas conflicting with science. Man, for the liberal Christian pastor, still remained the center of the universe, the possessor of an immortal soul, and the product of divine creation. The Hebrew bible was held as a product of revelation; the miracles of old were repeated as truths. In fact, the whole Mosaic cosmogony was present and believed, only clipped here and there where it conflicted too obviously with every-day knowledge. And even in the most liberal sects, where revelation was questioned and man acknowledged to be an animal, shreds of dualism, particularly as represented in the doctrine of teleology, remained. Nowhere in occidental religion, as Haeckel sur-

veyed it, was there a conscientious and successful attempt to view the universe wholly in the light of nature, and as a subject of rational inquiry.

Such was the position of religion: what was that of science? Before answering this question, Haeckel had to decide on the proper attitude for the scientist to take.

Metaphysicians, both in theology and in philosophy, long had maintained that the field of cosmic inquiry was no concern of science, that it lay beyond the knowing powers of the scientific investigator. With this view many scientists—probably most—agreed. Knowledge, they said, was confined to facts, demonstrable facts, and generalization must be left to those whose profession was philosophy and the explaining of revelation. For these gentlemen practised a method of learning higher than that of science: probings of the inner consciousness, and above all, the unfailing method of faith. Thus science and religion (for orthodox philosophy was little more than a branch of religion) moved on different levels of truth, and their assertions could not bring them into contact.

But, said Haeckel, here was a fundamental fallacy. The believers in faith and inner consciousness, were their claims good, should perceive truth alike, and should make no errors. But theologians differed with theologians, and philosophers with philosophers; what was good religion in England was anathema in Spain, and neither was admitted in India. Schopenhauer believed some things, while Hume and

Kant held quite differently. And when these gentlemen got together to find something on which all agreed, that something was a result of ordinary scientific investigation. Religion had maintained the earth to be flat and the center of the universe; now all educated theologians admitted that it was round and revolved about the sun, which was a small star. Yet this change was the result of knowledge achieved not by faith but by mathematics, astronomy, and experimental observation. The case could be multiplied by thousands, and in each the determining factor was not faith nor philosophy, but lowly science. Therefore, was it not logical to believe that all real knowledge came from experience and reason, since it was impossible to prove a single exception to the rule?

Moreover, science had passed through the stage where she must confine herself to mere cataloguing of details. Already she had begun to generalize, and those generalizations prevailed over the dualistic dogmas which opposed them. Therein the superiority of experience and reason over sentiment and imagination were established; it now was time to formulate a scientific philosophy that would offer a rational interpretation of the world as it was known, and provide a foundation for future interpretation and application of the results in scientific investigation.

It was natural that Haeckel, being principally an evolutionist, should sense strongly a unity in all things, and should make that unity one base of his philosophy. Also, he was directly

concerned with change, which he found everywhere in nature, so that the principle of change made the other base. The resulting philosophy was thus monistic, evolutionary, and strongly materialistic and rested on the following propositions, which Haeckel considered to be adequately substantiated by scientific investigation:

1. All being is one and all modes of existence are of one nature, so that all differences between them are of degree rather than kind, *i. e.*, quantitative instead of qualitative.

2. Being is not motionless, but possesses a principle of change; this change is purely mechanical, and subject to uniform mechanical laws. Moreover, it is the origin of the various kinds of existence, which therefore are wholly natural and materialistic.

3. States of being and change being wholly natural, all processes of learning about them are natural, and only those conforming to natural states of being and change are to be relied upon.

Starting from this position, science and scientific philosophy put forward conclusions irremediably hostile to religious dogmas. Man becomes but a part of the great system of change, a part just as surely connected with the lowest protist as the butterfly is with the egg. His "divine" superiority becomes but a phase of vertebrate dominance, and his mysterious mind but the function of cells and organs. The "immortal soul" is but a figment, or at best a phase, of this mortal mind, that

ceases to exist when the body no longer functions. In place of divine purpose is natural evolution, whose results are what they are because they could not be otherwise. The universe is ruled by mechanical forces, with no traces of an omnipotent, anthropomorphic god who can and does upset them at will. Not even human knowledge retains its mystery. Science knows nothing but experience. No idea, according to the scientific view, has value unless it is either the immediate expression of facts, or the result of an inference determined by those natural laws which govern the association of ideas." And since all knowledge is of mortal origin, none of it is absolutely final and infallible.

Such, then, is the conflict. There is no possible means of uniting science and dualistic religion,¹ for wherever they meet they contradict. The enlightened and wholly consistent man cannot approve of both at the same time and so must choose one or the other.

When the three elementary propositions of

¹Haeckel was not considering, nor am I, such religious systems as that of the liberal Unitarians. Many of these people hold views which almost duplicate those of Haeckel; others go even beyond him and maintain a materialism or agnosticism as pure as that of the most agnostic science—and often purer than that of the rationalist. Such beliefs do not, it seems to me, constitute a religion: they are essentially philosophic. Yet, in view of many of Haeckel's strictures against ALL religion we must not forget that many a unitarian believes in immortality of the soul, in theology, and in other dogmas of ancient dualism.

monism are admitted—as Haeckel believes must be done by everyone familiar with modern natural science—it becomes obvious that the scientific path in philosophy is the only safe one to truth. For centuries religious and philosophical metaphysics have struggled with the problem of the cosmos, and have achieved astonishingly little. The very disregard which they meet in the realms of science show the slightness of their result, while detailed analysis and comparison with known facts make this but the plainer. Experience and reason, on the other hand, have done great things even under the handicap of official interference from the opposing side, and have accumulated a surprisingly slight by-product of harmful falsehood. These facts alone, says Haeckel, are enough to make every rational man acquainted with them willing to try the new method in philosophy, particularly when it has become equipped with the mightiest cosmic concept of the ages—that of organic and inorganic evolution. Let us leave faith and revelation, he says, along with the useless lumber that they have accumulated. We have a new tool, one that is of proved worth, and that conforms to the only known, demonstrable way in which man is able to achieve knowledge. It was offered us two thousand years ago and disregarded, with dire consequence; let us take it now that it returns reinforced by growth, and with it achieve a measure of truth but dreamt of by our forefathers.

CHAPTER III

THE SEVEN ENIGMAS

And now, having surveyed the basis for and the origin of evolutionary monism, let us cast a glance at the sort of a universe which it presents to us. This glance is formulated by Haeckel in what he calls the "twelve cosmic theorems," and as we shall see, they either follow upon or conform with the three essential postulates of his philosophy.

But before giving them, it will be well to make some explanation, more because of criticisms that have been made than because of defects in the theorems themselves. In the first place, they do not conform absolutely with modern science, for they were written in 1899, at a time when various evolutionary details were less fully understood than they are today. Thus we now know that, whatever else may have occurred, the earth did not go through a long initial process of cooling; that water came in as soon as the planet was large enough to hold it. We also know that mammals come from reptiles and not from amphibia, and that the Tertiary is a vastly more complicated division of geologic time than Haeckel knew it to be. But all of these points are mere details—errors that must appear in any worth while book of science that lives more than a dozen years. We may note them and pass them by; they have little to do with the essence of monism.

More important it is to remember that

Haeckel was an artist as well as a philosopher-scientist, and that he is fond of speaking in figurative language. Thus energy, which he holds to replace spirit, he nevertheless often designates by the latter name—a proceeding that causes Professor Külpe much discomfort. Atoms, since they have the same force which gives rise to the “soul,” are said to have souls, and so on. One must keep this ever in mind, or he is apt to think Haeckel the most irrational of pantheists. With these preliminaries we may proceed to the theorems themselves.

1. The universe, or the cosmos, is eternal, infinite, and illimitable.

2. Its substance, with its attributes (matter and energy), fills infinite space, and is in eternal motion.

3. This motion runs on through infinite time as an unbroken development, with a periodic change from life to death, from evolution to devolution.

4. The innumerable bodies which are scattered through the space-filling ether all obey the same “law of substance;” while the rotating masses slowly move towards their destruction and dissolution in one part of space others are springing into new life and development in other quarters of the universe.

5. Our sun is one of these unnumbered perishable bodies, and our earth is one of the countless transitory planets that encircle them.

6. Our earth has gone through a long process of cooling before water, in liquid form (the first condition of organic life), could settle thereon.

7. The ensuing biogenetic process, the slow development and transformation of countless organic forms, must have taken many millions of years—considerably over a hundred.

8. Among the different kinds of animals which arose in the later stages of the biogenetic process on earth the vertebrates have far outstripped all other competitors in the evolutionary race.

9. The most important branch of the vertebrates, the mammals, were developed later (during the Triassic period) from the lower amphibia and the reptilia.

10. The most perfect and most highly developed branch of the class mammalia is the order of primates, which first put in an appearance, by development from the lowest prochoriates, at the beginning of the Tertiary period—at least three millions of years ago.

11. The youngest and most perfect twig of the branch primates is man, who sprang from a series of manlike apes towards the close of the Tertiary period.

12. Consequently, the so-called history of the world—that is, the brief period of a few thousand years which measures the duration of civilization—is an evanescently short episode in the long course of organic evolution, just as, in turn, this is merely a small portion of the history of our planetary system; and as our mother earth is a mere speck in the sunbeam in illimitable universe, so man himself is but a tiny grain of protoplasm in the perishable framework of organic nature.

It is plain that these theorems, while of un-

even significance, picture a universe that is rational, and a world whose organization fits in with positive scientific knowledge. Yet, as Haeckel was the first to admit, it was a world about which all too little was known. This same fact was strongly emphasized by another philosophic scientist, Emil du Bois-Reymond, and the challenge of the universe to science was summed up by him under seven heads, the seven world-enigmas. And Haeckel, though he maintained that all of them were but aspects of the one great problem of substance, accepted them for convenience just as they were presented, and sought to show how his particular interpretation of monism answered, or sought to answer, them at the beginning of the present century. This effort forms the substance of his best known book, the "Riddle of the Universe," and upon it the balance of this chapter is based.

These riddles were stated by du Bois-Reymond in 1880 as: 1. The nature of matter and force. 2. The origin of motion. 3. The origin of life. 4. The (apparently preordained) orderly arrangement of nature. 5. The origin of simple sensation and consciousness. 6. The origin of rational thought, and its cognate faculty, speech. 7. The problem of freedom of the will.

Of these, du Bois-Reymond considered numbers 1, 2 and 5 to be purely transcendental and insoluble. Three others, 3, 4, and 6, he judged susceptible to solution, though only after great labor and thought. About the seventh he remained undecided.

Haeckel adopted a very different view. In the first place, he held that it was dogmatism pure and simple to judge anything to be absolutely unknowable. It might be unknown, and remain so for many centuries, but that was no guarantee that its secret never would be discovered. Man had learned many things that were supposed to lie beyond the fields of knowledge, and all cosmos was legitimately his field of exploration. Furthermore, he did not believe that these unknowables even were unknown. "In my opinion," he wrote, "the three transcendental problems . . . are settled by our conception of substance; the three which he (du Bois-Reymond) considers difficult, though soluble, are decisively answered by our modern theory of evolution; the seventh and last, the freedom of the will, is not an object for critical, scientific inquiry at all, since it is a pure dogma, based on an illusion, and has no real existence."

Let us turn our attention to the solutions which Haeckel so confidently offers to these problems. Are they real solutions, and how do they rank in science after the passing of a quarter century?

In the first place, says Haeckel, Professor du Bois-Reymond's difficulties arise principally because he puts forth under the name of matter an indescribable something, both amorphous and inert, and then puzzles himself as to how, from such near nothingness, such powers as movement and consciousness can arise. But, as Boutroux points out, "the hypothesis from which we thus start is arbitrary and imaginary.

Such a substratum is neither given nor conceivable. Science, from her knowledge of facts alone, cannot allow a principle of this kind. That which is given irreducibly, and which, in consequence, is of prime importance to her, is not an indeterminate and passive substance, incapable of entering upon movement and action unless stirred and quickened from without; it is as essentially animated substance, at once extension, *i. e.* matter, and energy, *i. e.* mind."

The conception is not a new one. "We hold with Goethe," says Haeckel, "that matter cannot operate without mind, nor mind without matter. And we approve the comprehensive monism of Spinoza: Matter, or infinitely extended substance, and mind, or feeling and thinking substance, are the two fundamental attributes of the divine essence (universal substance) which embraces all things."

On the face of it, this is not a little metaphysical, yet we find that it is but a slightly poetic statement of the essential conclusions to be drawn from the pyknotic theory of substance advanced by J. C. Vogt in 1891. On this theory ether becomes a necessary fact—a non-granular substance filling all space and conditioning, if not giving rise to, matter. Haeckel states the monistic theses which he finds involved in this theory clearly:

I. The two fundamental forms of substance, ponderable matter and ether, are not dead and only moved by extrinsic force, but they are endowed with sensation and will (though naturally of the lowest grade); they experience an inclination for condensation, a dislike of

strain; they strive after one and struggle against the other.

II. There is no such thing as empty space; that part of space which is not occupied with ponderable atoms is filled with ether.

III. There is no such thing as an action at a distance through perfectly empty space; all action of bodies upon each other is either determined by immediate contact or is effected by the mediation of ether.

Just how far Haeckel is safe in saying that such theses are "indispensable for a truly monistic view of the universe" is uncertain; probably, as often is the case, he here becomes unduly dogmatic. But plainly, whether indispensable or not, they offer a clear and consistent view of some very puzzling cosmic problems. And, whether we grant its truth or not, we can say the same of the much combated "Law of Substance." For it is little more than a combination of two well-known principles of chemistry and physics: those of conservation of energy and conservation of matter. And since, on the Vogt-Haeckel theory, energy and matter are but two aspects of the same essential, substance, and always are manifest together, it is but logical to unite under one heading the essential laws of their behavior. For myself, there is nothing puzzling about such a union, though I am well aware that it enjoys no great popularity among chemists and physicists. They maintain that nothing is gained by it; that the two laws are just as distant when put together as they were before. Perhaps they are right, but even if they

are it makes little difference with the main conception of the unity of all things.

As we have seen, Goethe clearly formulated the conception of cells, molecules, and atoms in which were to be found the elements of so-called "consciousness." He pointed out that the motives which govern human actions and affinities are but those which may be found in the cells of the body, and Haeckel and Vogt only followed him in extending the force into inorganic nature. Certainly, if the body is made up of molecules, atoms, and electrons, it is but rational to suppose that the characteristics of the whole are to be found to some extent in its parts. The passion which drives a lover toward his beloved is as much a matter of chemistry as is that which forces two atoms of hydrogen to wed one of oxygen and thus unite into a molecule of water. Nor is this purely a matter of inference! today physiologists actually are able to isolate some of these chemical controllers of passion, and thereby produce at will impulses that do not exist ready formed in the organism.² Therefore, whether we accept or reject Vogt's Pyknotic Theory of matter, on which Haeckel builded, we must admit the truth of his assertion that fundamentally the inorganic and the organic are one. Today we use different words than

²The whole of recent discoveries as to the function of glands is in line with this, as is also the work on chemical fitness of organisms. A very recent example of the isolation of a specific factor is the production, in quantities large enough for experiment, of the substance causing sexual excitement in female mammals.

those in which Haeckel wrote in the 'eighties, but the meaning essentially is the same. We speak of reducing the qualities of life to elaborate chemical reactions and then to simpler ones, but by that very reduction we are assigning to the atom and electron the attributes of life, even though in a very limited and simplified degree.

Let us now see what bearing this has on the "insoluble" world riddles. The nature of matter and force, on Haeckel's theory is at least partly answered, for they become two aspects of one thing, substance. Precisely what substance is he is uncertain; the more it is simplified the remoter it becomes. Perhaps it is ether, or an unknown constituent of ether. But at any rate it is fairly plain that for a long time to come it will be beyond the ken of man. Perhaps it forever will remain so, for the human mind is finite and clumsy, the function of a none too perfect nervous system. It is conceivable then, that substance will prove to be the ultimate, mysterious "Thing in Itself" for which Kant sought, but which cannot be probed by experience or reason. But if that be true, says Haeckel, why bother with it? If something is for us unknowable, how can we be sure of it? There is much to learn that can be learned, and even though we may not be able to find out what substance *is*, we can discover much about how it *acts*, and that for many centuries will do admirably for our purposes.

The question of the origin of motion accompanies that of the nature of matter, for motion

(energy) is but one aspect of matter, which is part of substance. It is the same with sensation and consciousness; if they are innate in matter and substance we hardly can look farther for their origin. While those phenomena which the religious or dualist psychologist calls by these names, and over which he puzzles greatly, are nothing but compounds of atomic and cellular energy or "consciousness"—the synthesized souls of ten billion atoms. Of course, there is an important problem in connection with the development of such syntheses, but it is not a problem of origin in the strict sense. Truly, if we can accept a naturalistic conception of substance, the insoluble becomes surprisingly simple!

Nor do I mean by "naturalistic conception" that of Haeckel alone. Probably any idea of matter that coincides with known facts will enable us to formulate rational hypotheses in solution of the three most difficult riddles. For many years they will be only hypotheses, let us admit, and we have no right to be so sure of our stand as was Haeckel. One thing the discoveries of the last century have taught us is the value of caution and healthy agnosticism, but it was a lesson that Haeckel never fully learned.

We need spend but little time on the three riddles whose solutions fall within the field of organic evolution. If that doctrine is accepted in its entirety, so as to exclude all dualism and teleology, then the origin of life can not possibly be anything more mysterious than the accidental combination of chemical

elements in some ancient sea or pool. True, we do not know how, or where, or when, but we do know what, and that is of prime importance. Nor does the apparently preordained order of nature present insurmountable difficulties. In the first place that order is by no means so perfect as it seems, as I have tried to show in the booklet on the "Fitness of Life." In the second, such perfection as does exist is found largely because we are part of nature, having developed as the whole system developed, and are therefore in accord with it. And finally, we are coming to realize more and more clearly a truth that is corollary to every explanation of evolution: namely, that things are as they are because they cannot be otherwise. Were nature in disorder most of it would perish, and the portions that did not would be so adjusted to each other and thus order would be the ultimate result. Fundamental disorder is impossible in a working system.

The remaining of du Bois-Reymond's riddles is answered by both the monistic conception of matter and the doctrine of evolution, as well as by known facts of physiology and psychology. There no longer can be serious doubt that the mind, or will, or soul, is inseparably linked with the body. We need but point to the conduct of a drunk man, or of a victim of fever, to establish the connection. And if the behavior of the will is dependent—as we know it to be—upon such mundane factors as food, drink, temperature, gland secretion, and the action of microbes, what chance is there of its being free? Within physiological limits, of

course, it exercises a certain liberty and self-control which are the basis of mental progress, but beyond them it is of the earth earthy. As Haeckel says, the conception of free will is mere dogma, based on that most ancient of illusions, the dream.

And so we have the answers of science and the monistic philosophy to the great enigmas of the world. They are not final answers; in detail they are even less so than Haeckel supposed them to be. But they are answers, built up from human experience and inference governed by the rules of scientific thought, and even if eventually supplanted by others they will stand as definite and useful contributions to knowledge. As such they serve as steps by which we may progress to higher and higher accuracy, and thus, whether right or wrong, they serve the real purpose of philosophy, which is the search after truth.

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Let us now return to our conception of substance, for it is with it and the doctrine of evolution that science seeks to solve all problems. As Boutroux says in summing up this effort:

"First of all, opposite ponderable, inert matter, science sets the ever-moving ether or imponderable matter: at the same time premising, between the ether and ponderable matter, eternal action and reaction. And these two elements, representing the twofold division of universal substance, suffice to explain the most general phenomena of nature.

"Science, however, labors in vain so long as

she fails to grapple with the greatest and most difficult problem which the mind of man is called upon to face—that relating to the origin and development of things. Now she can, henceforward, for the purpose of solving this problem, make use of the magic word that Lamarck and Darwin have taught her, viz. Evolution. By virtue of the laws of evolution, the various forms of existence are connected with one another through natural descent; their development is explained by the simple action of uniform mechanism. And, though a thousand problems still remain unsolved, we are able, in the light of those we have already succeeded in overcoming, to realize that all partial questions bearing on creation are linked together indivisibly, that they represent a cosmic problem which is one and all-inclusive, and that, therefore, the key to one problem necessarily is the key to every other.

“But what is the origin of evolution itself? Must we attribute it to the action of a supernatural principle, and thus leave present in the whole that very element of miracle which we have driven out of the parts?

“We should be brought to this extremity if we took for our principle a matter destitute of energy and, on that account, incapable of evolving by itself. But the animated substance that we have put forward, has, within itself, a principle of change and of creation. It does not exclude God, it is, itself, God—a God intramundane and identical with nature. It ought to be understood that, if the scientist rejects

Theism, he no less rejects Atheism. For him, God and the world are one."

And thus disappear not only the enigmas we have examined, but many others as well. Haeckel, by nature a dogmatist as well as a doubter, considered them solved; we shall do well to say that they have been taken from the realm of insolubles and answered by rational hypotheses. At least, the unknowable has ceased to exist; the term stands only for the unknown. "It is no longer with the principles of things, but their details only, of which, in the future, we can remain in ignorance. The philosopher is little concerned that the extent of this ignorance is enormous, and must always continue to be considerable. The really significant point is that it constantly grows less as the means by which man attains knowledge are improved.

Yet does this mean that all riddles are gone, that there is no further enigma? Haeckel answers no. The problem of substance remains, as far from our knowledge as it was from that of Anaxagoras, Lucretius, Kant, or Goethe. The more we investigate this substance, says Haeckel, the more mysterious it becomes. We do not know the "thing in itself" that lies behind knowable phenomena. But why trouble over it if we have no means of investigating it? "Let us leave the fruitless brooding over this ideal phantom to the 'pure metaphysician,' and let us instead, as 'real physicists' rejoice in the real progress which actually has been made by our monistic philosophy of nature."

We have a different work, and in this world
of ours which is

“By eternal laws
Of iron ruled
Must all fulfill
The cycle of
Their destiny.”

CHAPTER IV

MONISM AS A RELIGION

We have seen that, wherever they meet, monistic science defeats and supplants traditional religion. They begin with fundamentally opposite assumptions—the latter, that man knows all, even though there are many things that he cannot learn; the former, that he knows nothing, but can learn all things discernible. And the results of these systems differ as greatly as do their premises, for a critical examination of the dogmas of dualistic religion as opposed to the conclusions of science leaves no doubt of the superiority of the latter. Does it follow, therefore, that religion must be consigned to the past, “among those things which time has cut down and which are to be traced merely in the pages of history?”

The more materialistic scientist is apt to feel that this is the case, particularly if he considers religion and science as simple abstractions quite apart from the mind of man. But this, says Haeckel, is a false conception. Religion has not been devised entirely for the

benefit of theologians and the preservation of ignorance; its real aim is to satisfy certain elementary needs of humanity, and so long as it can be shown that these needs endure and are unsatisfied by pure science, religion in some form is necessary to human happiness. And Haeckel is too thorough a scientist to wish to remove an essential, even though he is unsatisfied with its present form.

One of the primary needs of the human mind is an explanation of the origin and nature of things. For a long time this was thought to be wholly within the province of metaphysic, and was ignored by science. But today the reverse is true; science takes most of its time seeking out and elucidating causes, while metaphysic does little more than mouth ancient and useless dogmas. And such a reversal causes one to ponder. Is it not possible for a monistic philosophy founded on science to satisfy practical religious needs as well as theoretical?

Haeckel believes this to be possible. The scientist, he says, who through reflection has become a philosopher, and has discovered the means of carrying the rational inductions begun by science to their ultimate ends, need feel no anxiety over the problem of religious need. For he knows the practical range of science to be no less great than its theoretical, and he is ready to show that, through her superior knowledge of the universe and of life, she alone is capable of bringing correct emotional satisfaction to man. Yet at the same time, the scientist must admit that these considerations are

still largely theory. The practical application of scientific principles is a slow process, and for a long time there will be gaps by virtue of which the established religions will retain their hold. "And not only will these religions be actually maintained so long as science shall fail to perform all the tasks that she has undertaken; but their preservation, during that period, ought to be considered salutary and good in some respects." I am not sure how far Haeckel agrees with this idea of Boutroux, for he maintains a very uncompromising attitude toward all established faith. Yet in practice he conformed to a realization of it, and of his own religious needs.

So even though we may think that eventually science can supplant all religion, the fact remains that for centuries it cannot do so. Therefore, Haeckel finds it essential that science come to terms with the most fundamental concepts of religion and discover a bond which will unite them into one. And this, he believes, is furnished by his philosophy of evolutionary monism.

Monism, he says, when followed to its practical ends, results in a three-fold division, in accordance with the highest efforts of intellectual man. "Monistic investigation of nature as knowledge of the true, monistic ethic as training for the good, monistic aesthetic pursuit of the beautiful—these are the three great departments of our monism: by the harmonious and consistent cultivation of these we effect at last the truly beatific union of religion and science, so painfully longed after by

so many today. The True, the Beautiful, and the Good, these are the three august Divine Ones before which we bow the knee in adoration; in the unforced combination and mutual supplementing of these we gain the pure idea of God."

So much, then, for the principal tenets, or purposes of the monistic religion. What, now, shall be the attitude of monism toward these elements in other religions, and particularly in Christianity, the faith with which science at present has the closest contacts?

So far as truth goes, the monist must abandon all idea of revelation. If there is truth in other religions it is there because it has been thought out by man, and where found, it is the right of the monist to use it. Indeed, Haeckel favors the adoption of reliable ethics of long standing, since they possess the great advantage of familiarity. Thus we find him taking from Psittacus, Confucius, Aristotle and Jesus, the precepts for his monistic ethics,—a proceeding for which he is severely criticised by more than one theistic author. Apparently these men fail to recognize the true worth of the ideas they profess, since they demand that the monist produce an "original" ethical system. Or perhaps they dislike to see precepts which Christianity has disregarded for centuries because of conflicting falsehood combined with another philosophy and put to good use.

As concerns Beauty, says Haeckel, the conflict between monism and Christianity is especially acute. For Christianity teaches man to

despise nature—to look upon it as something lowly, hostile, and evil in purpose. “It extols ascetism—the emaciation and disfigurement of the human body. It challenges the arts, seeing that their creations always threaten to become, for man, idols capable of serving as a substitute for God. In fact, what is called Christian art has never been anything but the protest of the imagination and of the senses against the ultra-spirituality of the Christian standpoint. How are we to reconcile the grandeur and beauty of Gothic cathedrals with a religion that regards the earth merely as a vale of tears? Christian art is a term involving contradiction. Monism, on the other hand, is essentially naturalistic, and a friend of Beauty, which it recognizes as an end in itself. Consequently, it will oust Christianity from the domain of art, no less than from the domain of science.”

We already have touched upon the department of Goodness, in connection with Truth. But we did not note that, while Haeckel finds a great deal of value in Christian ethics, he does not credit them greatly to that religion. The most valuable of them, the Golden Rule, was stated clearly at least six hundred years before the birth of Jesus, and repeated over and over again in the centuries between. Moreover, with precepts of value, revealed religion invariably combines much that is false, harmful, and unnatural, which can be allowed to stand only by being disregarded. Monism, however, discards the patently false and balances the others in accordance with its scientific knowledge of the nature of man.

Thus we find that it is possible to construct, from monism a system of religion—though not of faith—which is at one with science. It is, of course, far from religion as that term is generally understood, and doubtless much too far to offer attraction to the general run of humanity for many years to come. Probably for centuries there will be a duality of religions in Christendom; one type, the monistic, maintained by those who are willing to accept in full the findings of science; the other, dualistic, held by the masses, and making constant grudging allowances to knowledge as the position of theology becomes more and more untenable.

The most important means by which monism may make use of existing religions and at the same time free itself from their bondage is to bring about a complete separation of church and state. Theoretically, of course, this is an accomplished fact in several occidental countries, but practically it is but a dream of the future. In England it is but a few months since a court decided that, for good or evil, Christianity was a part of the law of the land, while the countless purely Christian laws on our statute books, the furtherance of Christianity by such state-supported institutions as many of our universities (at not a few of which open avowal of agnosticism is enough to bring official reprimand to either student or teacher) and public schools, all suffice to show the state of affairs in the United States. Not until the church is on the same footing as any other social organization can either science or

monism hope to be free from official interference.

The positive side of this negative demand is educational reform. For, though our schools are by no means so bad as they were when Haeckel wrote the "Riddle," they still remain firm strongholds of superstition, ignorance, and dead information. The average teacher knows far more about Genesis than about evolution, while the typical high school student goes forth with a firmer grounding in Latin and solid geometry than in physiology and the nature of life—if he has any real training in either. As for the college graduate, even the lawyer or doctor, with negligible exceptions he has little philosophic basis in the biologic sciences. Almost without exception our lawyers, judges, statesmen, and social reformers have but the slightest and haziest conceptions of human nature and its origin, and none whatever of the essential conditions of human conduct. The medical men, it is true, are somewhat better equipped, but even they are apt to rely on faith and tradition when they face the social phases of their subject. Our supposed leaders, therefore, are in the light of modern science, astonishingly and disastrously ignorant.

These defects Haeckel would remedy by social, but first by educational reform. For education is just as important a means of extricating humanity from error as it has been in keeping him steeped therein. The object of a general and genuine education is to form man in his full intellectual capacities: to care for the emotional and reasoning sides of his abilities with

equal thoroughness—for his religious “soul” as well as his scientific mind.

Public education, being an activity of the people as a whole rather than of a single group, must keep itself clear from religion. It shall not prohibit instruction in faith, but that instruction shall be apart from it, and of a type not too detrimental to the child—for after all, education is for the benefit of the recipient, not the donor. Furthermore, its immediate purpose is to inculcate knowledge, as it is determined by the highest methods of investigation. Thus it must make use of the principles of scientific monism, and enforce morality and ethics only insofar as they are in keeping with real knowledge. Religions, to be sure, should be studied, but not as sacred bodies of revealed truth. Rather, they must form the subject matter of an almost unknown science, that of comparative religion, which will seek to trace the religious thought of man through the ages, picturing both the failures and successes of his long quest for ultimate truth. In addition, the myths and legends of both Christianity and other religions may be studied as anthropological and literary documents, as are the ancient Greek, Latin and Norse myths. The ethical and aesthetic value they may contain will not be lessened by being traced back to their human origin, but rather will be increased and put in proper perspective.

And thus, through education in which tradition receives its proper treatment and the facts of nature are given due importance, man even-

tually will come to that stage where, possessing both science and art, he will also possess rational religion. Such a man will have no need for elaborate temples and shrines to relieve him from the misery and dullness of daily life. For though, "through the length and breadth of free nature, wherever he turns his gaze, to the whole universe or any single part of it, he finds, indeed, the grim struggle for existence . . . by its side ever are the 'good, the true, and the beautiful'; his church is commensurate with the whole of glorious nature. Still, there will always be men of special temperament who will desire to have decorated temples or churches as places of devotion to which they may withdraw. Just as the Catholics had to relinquish a number of churches to the Reformation in the sixteenth century, so a still larger number will pass over to 'free societies' of monists in the coming years."

To the philosophic scientist this is an attractive prospect, but the events of the quarter century that has passed since Haeckel wrote this paragraph do not give us a strong hope for its prompt fulfillment. Undoubtedly man is a reasoning animal, but none the less he is extremely reluctant to exercise that power on abstract problems which he can dodge by means of tradition. As Robinson has shown all too well in his "Mind in the Making," most of humanity opposes progress far more strenuously than it ever seeks to advance. We have but to glance at the reaction on all sides which has succeeded the World War, and in particular the organized attack upon evolution, and other

fundamental biologic facts, to have ample proof of this statement. Some day, perhaps, numbers of church edifices actually will be turned over to a monistic religion, but for the present century and the succeeding one the number will remain very low. Men are yet too much shrouded in their animal heritage to take great interest in either the true, the good, or the beautiful.

But it is neither fair nor satisfactory to criticize a religion from the practical side alone. For practice may have little to do with truth, and immediate usefulness may tell little as to essential value. What is really important is to find out whether the monistic philosophy is able to perform the specific task that Haeckel has set for it, that of refuting and ultimately replacing revealed religion. And before seeking to establish an answer to this we must go still deeper into the problem and determine whether or not it is proved that a scientific philosophy may be created at the present state of our knowledge. These two lines of inquiry will form our criticism of Haeckel's doctrine.

CHAPTER V

A CRITICISM OF HAECKEL'S MONISM

The idea of combining science with philosophy was a very natural one in the Greek and Roman worlds. In fact, science, as it was then practiced, was little more than a department of philosophy, for it contained but little of the

observational, descriptive work which characterizes the science of today. Rather, the science of those times was metaphysical, finding its great field in speculations as to causes, orders, harmonies, and unity in things. And, as one critic points out, philosophy was the mind recognizing its own aesthetic and rational principles in those of nature and of human life.

But for modern man the outlook is very different. Philosophy has clung tenaciously to metaphysics, while science, in her effort to become dehumanized and accurate has more and more dispensed with all traces of that department of inquiry, until there are scientists who even maintain that generalization is no part of their work. Science seeks to be, above all else, positive and free from error, and to do this she must keep closely to facts, even when theorizing, and her votaries look with suspicion upon any movement to ally them with the philosophy from which they have broken free.

Philosophy, according to Haeckel, essentially is the inquiry into the origin and nature of things. "We can distinguish it from science properly so called through seeing that it is not satisfied with investigating the peculiar nature of such and such a body, or the approximate cause of such and such a class of phenomena, but that, generalizing problems, it considers whether there are, indeed, common and universal principles, capable of explaining both the laws of nature collectively and the origin of all existence." For a long time science was unable to supply philosophy with data adequate for the investigation of such problems, but that

day is long past. Today science, armed with such weapons as the law of substance, a knowledge of astrophysics, and the concept of organic and inorganic evolution, is in a position incomparably superior to metaphysic, so that through science alone is philosophy able to accomplish her task with any assurance of accuracy. In fine, she has little more to do than interpret rationally the discoveries of modern scientists, from Goethe and Laplace to Michelson, Crookes, and Henderson.

Haeckel's purpose, therefore, is to conceive scientific experience and philosophic interpretation as being at the bottom but one and the same mental process. This is indicated by the fact that whenever a scientist gains sufficient knowledge of his subject he finds himself interpreting the facts he has collected, and estimating their significance in connection with those of other branches of inquiry. Knowledge as derived from scientific experience and inference invariably organizes itself in such a manner as to suggest unity, cause, and explanation. Could we have a stronger reason for believing that science and philosophy are one, and that each demands the other?

For my part, this one fact is enough to establish both the possibility and necessity of evolving a philosophy from the data of science alone. To doubt it seems to me as unreasonable as to question, when a little box is opened and a head peeps forth, that there is a jack-in-the-box inside. Yet Haeckel relies but little on this phase of the subject, arguing instead more on the level of traditional philosophic method.

We know things, he says, by experience and inference; the former a matter of the senses, the latter the work of reason, which is a phase of the operation of nervous matter, though in a very different part of the nervous system from that which produces sensation. And since both sense and reason are equally natural in man, it is as legitimate to use the second as the first, providing only that it be exercised in conformity with the dictates of nature. For if the metaphysicians have been wrong in isolating reason from sense, the scientists would err equally in eliminating reason in its broader capacity for function. That such an isolation is impracticable is proved by fact as well as theory, for how can we describe the dynamic theory of heat, the theory of stellar development, or the doctrine of evolution as other than broadly rational, or philosophic doctrines?

Yet it may seem that Haeckel has not sufficiently established the transition from science to philosophy. Is it certain that because reason is a natural function of certain parts of the nervous system, and present in lower animals as well as in man, that there is in it no principle of interpretation, aside from pure scientific inference, by which man can view cosmic problems? To prove such an assertion do we not need a complete analysis of the contents of reason?

It seems to me that we can answer with a negative to the first of these questions, on both theoretical and practical grounds. Certainly the only basis for supposing such an extra-scientific principle would be some definite evi-

dence of its existence and its superiority to the scientific. Such evidence, acceptable to the supposedly inferior investigation of the scientific faculty—if one may use such a term—has been sought through many centuries, and the sole result is a mass of speculations most of which are either demonstrably false or patently beyond practical application. On the other hand, both from the form which knowledge takes as it accumulates, and the many examples of mental progress, we are justified in concluding that the functions of reason are essentially one. All knowledge that we *know* is the product of experience and reason; all other attempts at knowledge have failed except where they stumbled into these well-proved paths. Wherein, then, do we have reason to postulate a principle of which we know nothing? Perhaps we should not, as does Haeckel, dogmatically assert its impossibility, but certainly we can vouch for its practical non-existence, and can put forward the scientific hypothesis that it does not exist.

Nor, it seems to me, is it necessary to provide an exhaustive catalogue of the phases of reason. For insofar as the philosophy advanced by Haeckel goes beyond and differs from science, it does so only in degree, not in kind. In fact, if the initial theses of monism are carried to their conclusions, only science remains, and philosophy becomes a department thereof, carrying into farther realms the facts, theories, and hypotheses which the rest of science creates.

Moreover, it seems to me that the Haeckelian system, by its very existence, proves the possibility of a scientific philosophy explicable in terms of scientific method pure and simple. Professor Boutroux, as well as many less sympathetic critics, disagrees with this view, but it seems to me that his attitude is based on a faulty interpretation of scientific method as applied to the problem of dual principles of the reason. He relies too much upon theory, as does Haeckel, and forgets the practical aspects of the case—an error, it seems to me, into which philosophers of all schools are very apt to fall.

Yet this assurance of the possibility, or necessity, of a scientific philosophy is not an assurance as to the validity of any one scientific philosophy. Haeckel thinks it is, and that the system which he has perfected is the one that will stand. And here he falls into grave error. For he sets up as dogmas those formulæ which monism has drawn from science, proclaiming that the conception therein set forth is enjoined upon us once for all, as a logical necessity made plain by the recent advances in our knowledge of nature. In fact, he claims for those very propositions which are induced scientifically a certainty that is far beyond science, and falls rather in the realm of metaphysic dogma.

Such an error is the attribution to the principles and substance of monistic philosophy the traits of absolute determination, fixity, and eternity. Now, in accordance with scientific method we are entitled to advance such a view

as a hypothesis, but conform to that method and ascribe such a characteristic as eternity to even the most fundamental natural principle or law. For eternity obviously is a quality that cannot be probed, or seen, or demonstrated mathematically, and about such certainty is beyond us.

Similarly, Haeckel assigns universality as a second characteristic of his principles, and again he oversteps himself by making a dogma out of what is a legitimate hypothesis. One cannot possibly consider as scientific induction a generalization that extends to all possible kinds of existence the properties which science has established for those sorts that have come under her observation, and which considers that extension a certainty. Such an induction, as Boutroux points out, is of a sort having little or no value in science, since it is barren of both analysis and criticism. As a working hypothesis, perhaps some day to be verified, universality is legitimate; as a dogma it is neither scientific nor, in the long run, productive of the true knowledge which Haeckel undoubtedly desires. We might go on to multiply cases, but the undertaking is of little purpose—it long since has been accomplished by Haeckel's enemies. We may admit at once that on page after page of the "Riddle of the Universe" appear errors, both in fact and in theory, that seriously mar the work. Yet our interest lies less in these faults than in the merit the monistic system may possess in spite of them, and so we shall pause only to note the reason for their existence.

They rest, as nearly all errors or truths in thought rest, upon the nature of the author. Haeckel was not by innate disposition a monist, any more than he was a cautious, detailed philosopher, or a prudent agnostic. For him all right was on one side, all wrong on another; a law must be either non-existent or universal; a hypothesis either true or false. Nor was he truly widely read outside of natural science; such subjects as the history of religion, and even the history of philosophy were beyond his knowledge, and in them he made many blunders. But more serious, and responsible for his greatest errors, was his lack of true scientific agnosticism. He would faithfully promise caution and forbearance in fields unfamiliar, and fairness to opposing doctrines, and then in the heat of enthusiasm and propagandist zeal, promptly would forget all obligations. As for his strong religious tendency, he did not try to curb it—probably did not realize that it needed curbing. And so we find him ascribing to scientific hypotheses all the finality which he denounced in the dogmas of revealed religion, at the same time remaining wholly unconscious of the parallel. That he erred more in this respect than has many another philosopher who set out to find truth we cannot say, yet we must deplore the fact that, in developing a scientific philosophy, he departed so far from science.

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Let us now turn to the consideration of monism as a means of refuting and replacing

revealed religion, and try to estimate the extent to which it performs this task.

As a preparation for the final refutation of religion, as the word currently is used, Haeckel undertakes to exhibit their fundamental principle, dualism, in its opposition to reliable fact. This dualism he shows to be in definite contradiction to the known facts of science, as well as to the inferences which may reasonably be drawn from them. As for the doctrines and applications which dualism has developed in practical application, Haeckel distinguishes two main types: the conceptions of the duality of god and the world as expressed in the doctrines of design, and the duality of man and nature, as expressed in the doctrine of human superiority and freedom. And both of these groups of ideas he finds—and I think proves—to be incompatible with sound knowledge.

Theology, at its base, rests upon the idea that the universe is an inert machine. And since a machine demands guidance and motive power, theology provides a divine artificer whose wish guides the universe and whose will moves it. On such a conception the universe is an engine and God the superhuman man who built it, supplies it with fuel, and runs it.

But such anthropomorphism breaks down in the face of a world so complicated as we now know ours to be, just as the hypothesis of free will falls before an understanding of the countless obscure factors which govern human conduct. In this way the props of traditional religion fall before scientific conceptions of

things, not in themselves, but as they are—that is, free from encumbering mysticism.

But can we be sure that, in destroying anthropistic ideas of the universe and scholastic dogmas on the nature of man, Haeckel has destroyed religion?

If we mean by "religion" *all* religion in the broadest sense of that term the answer obviously is no, and Haeckel himself gives it when he recognizes the religious needs of man and proceeds to construct from the monistic philosophy a monistic religion. On this basis the question would be, not whether monism displaces all religions, but whether it proves itself superior to other religions. For, as Professor Paulsen points out, even the most dualistic of philosophies tends to overcome its dualism and achieve monism, for the reason that the unity of reality is so great that it forces any clear thinker to repudiate all concepts which seek to resolve it into discrete, heterogenous particles. Philosophers from Aristotle to Hegel have realized this and have striven to conceive a truly natural design that is "not external, but internal; not mechanical, but dynamic; not fixed, but living—a design which does not consist of any sudden overthrow of the natural order of things, but which, inwardly developing life and the struggle for something better, is manifested in the actual laws of nature."

There can be no doubt that such systems of thought have arisen, and that they approach close to a scientific conception of nature. Yet

insofar as they retain the notions of design and superiority they fall short of what we today consider scientific accuracy, and contain the seeds of error. For the more we know of the workings of matter and energy the less room we find for design, and the more evidence against it.

Nor can we trust a great deal to those purer religions which combine teleology with a conception of the unity of nature. For all too often that unity is interpreted in such a manner as to include God and man, and exclude the rest of the universe; to leave room for the old dualism under a slightly restricted form. And even less can we credit the concept of unity as it exists in such religions as Christianity, for experience teaches us that the idea of unity is completely lost in the pluralistic or dualistic dogmas of practice. The Christian who repeats the Stoic maxim: "In Him we live, and move, and have our being," means *we*, not *we*, plus all other animals, plants, and the minerals, atoms, and worlds. Traditional religions, then, while in theory they tend to unite the universe, do so in such a manner as to actually divide it along the time-honored lines of dualistic dogma.

It is, of course, possible to conceive of actual duality as merely the two aspects of unity, just as Haeckel finds in matter and energy the two aspects of substance. Such a conception, were it consistently applied, could give no great offense to the most thorough monist. The trouble is that it is not so applied; that

religion, whatever its professions, almost always in fact runs counter to both the doctrine of unity and the facts of science. Further than that, it takes upon itself the role of arbiter of morals, ethics, aesthetics, and learning, thus seeking to limit all humanity to its own more or less faulty conceptions. Therein it does untold harm, and almost deprives itself to the right of consideration at the hands of monistic science.

Thus it is that, considering religion as it is rather than as it ought to be, we find it both refuted and supplanted by monism. The few religions that are left untouched are themselves little more than monism with another name, and are far superior, both in enlightenment and accuracy, to the faith which at present controls humanity. Let us now see how capably monism fills its new role of the supplanter of this faith.

Here we come upon the stumbling block of personal opinion. What seems success to one is failure to the other; what is consistent for me is wholly contradictory to one who is differently minded. For myself, I can find little fault with monism as a practical religion. I know ministers who follow it and give good counsel to their congregations; I know children trained in accordance with it who are as good, as happy, and of more promise to science, than other children brought up in the precepts of dualism. I am convinced that monism furnishes a workable guide to human conduct and human thought, and that its right to considera-

tion in the fields of religion is thereby established.

The theoretical aspect, however, is less satisfying, and to some extent the difficulties encountered here affect the practical application of monism. We already have seen that religions, in order to satisfy the human need, have to possess a high degree of certainty, for the average man cannot be spiritually satisfied by a probability. This certainty Haeckel has given monism, not by any right drawn from scientific logic, but by concepts taken bodily from the realm of metaphysical dogma. That is, in order to turn his philosophy into a satisfying religion, he has elaborated it with embellishments that he could not obtain from science alone, but was forced to borrow from a system of thought which he believes to be outworn.

Thus he says over and over again that art and science possess the qualities of religion. Probably they do, but as yet the case is not proved. Most of us agree that truth, goodness, and beauty, are the highest things for which man can strive, but if demanded to prove our point we should fall far short of certainty. Seldom do two men agree wholly upon the meaning of any of these terms, nor have we yet attained the knowledge of mental processes which will enable us to assign physiological basis to any of them. The best we can do is to advance our idea as a working hypothesis, justifying it by experience and inference, but not making it an article of faith.

Yet this is precisely what Haeckel does, satisfying himself by saying: the cultured man of today, besides the fierce struggle for existence, finds everywhere traces of what appear to him to be truth, beauty and goodness, and he knows these traces to be real. But how do we know this? What essential connection is there between these two aspects of reality, the struggle for life, and the monistic trinity? Is it possible for science, after teaching us that war and destruction are fundamental in nature, to persuade us that truth, beauty, and goodness are everywhere present in the world, and that they should be the aim of all our desires and endeavors?

The fact is that, by the path which Haeckel chooses, this cannot be done. As the argument stands, he takes a subjective and imaginary injunction and sets it up as a part of real knowledge and obligation—a procedure which makes it little else than revelation. The one scientific process, that of establishing a hypothesis based upon observed conduct of man, we have pointed out, but it would have lacked the certainty that Haeckel's nature demanded, and that is sought by the mass of humanity. The only satisfactory explanation of Haeckel's method of deriving a monistic religion is that, having derived from science a philosophy that both pictured the universe and contradicted revealed religion, he proceeds to bring his philosophy near the level of that same religion in order to render it capable of supplanting them. A most unscientific pro-

cedure, in which the end, as a conglomerate principle, has somehow created the means!³

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In attempting to reach a final estimate of the value of Haeckel's monistic system we must give attention to the idea it contains rather than to the manner in which it is executed. For even though the latter may be faulty to the point of embarrassment, it does not follow that the former is false. As a rule, a philosophy falls, not because it is poorly worked out, but because it lacks that content which give vitality and force. And thus it is significant that the idea which forms the base of Haeckel's philosophy is the one which to-day is uppermost in the enlightened world. We may express it as follows:

Man has one genuine certainty, science, and the more he reflects upon this certainty the more sure he becomes that he does not, and cannot, possess any other. Therefore, unless he would erect foundationless structures, he must take for the basis of all his theories the data of science. Only by this course can he hope to attain truth.

Yet, while conducting his thoughts in accor-

³Professor Boutroux, in line with his interpretation of the way in which Haeckel derives his philosophy, takes the view that he "has raised science to the rank of philosophy in such a manner as to find it the means of overthrowing religions." If this means that such a result was premeditated, the accuracy of the statement is to be questioned. It seems to me that Haeckel does not depart from science until he attaches metaphysic attributes to rational hypotheses—a process that follows after the derivation of philosophy from the data of science.

dance with fact, man is unable to give up a manner of thought which, he feels, links him up with the nature of things and the nature of himself, and constitutes what he feels to be his goodness, his ability, and his happiness. For these qualities mean much in his experience and life without them would be unbearable and hopeless.

But, objects someone, to all this science is deeply indifferent. To this Haeckel agrees, and it is here that we come upon the idea which entitles him to construct a philosophy—that in science one will find nothing but science. But reflect on what that science contains, interpret the principles, methods, and results, and we produce a scientific philosophy which will prove useless all traditional religion. Then, again in accordance with the principles and methods of science, interpret that philosophy in accordance with the needs of man—not forgetting to interpret properly these needs themselves—and we have a religion of science. All this Haeckel believes he has accomplished. To a certain extent he has, though the result is sadly blemished by eclecticism.

The question naturally arises as to whether it is possible to carry out Haeckel's idea in such a way as to avoid the defects which we find in his own formulation of the system. To this we may, I think, answer in the affirmative, for the principles that shall guide us already are outlined by Haeckel himself.

Let us consider for a moment this scientific philosophy—which, if we grant the known

facts of consciousness, is the only sort of philosophy worth while today. It seeks above all to be what its name indicates, and therefore sets aside every metaphysical or subjective datum, and restricts itself to objective, scientific facts, and accordingly, to scientific hypotheses and theories. It desires, literally, "to have no other foundation than science, no other organ than reason, and to be strictly tied down to the logical methods that science asks of her." Nor need such a philosophy worry greatly over the more abstract elements of religion, for it will find ethics much more suited to scientific determination. For though we may never discover what is ultimately right or ultimately wrong—supposing such mysteries to exist—we may, by careful application of sound science, discover a great deal about present right and present wrong. At the same time, we shall take care not to dogmatize, nor seek to assign eternity to our conclusions, for one of the most essential factors in scientific thought is the retention of doubt. A thing will be good only so long as conditions of our knowledge show it to be good, and when they indicate otherwise we shall be willing to change. A law or a custom shall hold only so long as it is justified by its operation; after that it shall be discarded in favor of something that works better. For change is the most constant nature, to assign permanence to temporal things is to defy science.

As for the aspirations of man, we shall take them as data of experience, to be used and satisfied in accordance with fact and reason. The longing for something is as much a fundamen-

tal in man as is the development of old age, and is as much deserving of scientific consideration. Let us accept this longing as something not to be suppressed or avoided, but to be directed and satisfied in accordance with the best knowledge that we possess. For undoubtedly man is far from perfect, as the most casual glance at his present state makes plain, while our knowledge of evolution entitles us to advance the thesis that he can be improved. Both evolution and anatomy substantiate the belief that this improvement must be a matter of intelligence, of the mind—that it is only by rational satisfaction of the desires of man that we can approach Haeckel's divine trinity of the True, the Good, and the Beautiful.

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